

WHAT IS CLAIMED IS:

1. An ultrasonic operation system comprising:
  - a handpiece including an ultrasonic transducer, which treats a living tissue using ultrasonic oscillations generated by the ultrasonic transducer;
  - a driving signal oscillator for producing a driving signal for driving the ultrasonic transducer and supplying the driving signal to the handpiece;
  - a sweep circuit for sweeping a frequency of the driving signal;
  - a data transfer circuit for transferring start frequency data to the sweep circuit to start sweeping the frequency of the driving signal;
  - a detection circuit for detecting a resonance frequency of the handpiece based on the driving signal of which the frequency has been swept by the sweep circuit; and
  - a phase lock loop (PLL) circuit for locking the frequency of an output current onto the resonance frequency; and
  - a switch for switching between the PLL circuit and the sweep circuit according to a detection result from the detection circuit.

2. An ultrasonic operation system comprising:

a plurality of handpieces including ultrasonic transducers which generate ultrasonic oscillations and exhibit different resonance frequencies respectively, and which are used to treat a living tissue using ultrasonic oscillations;

a connector through which the plurality of handpieces are selectively connected;

a driving signal oscillator for producing a driving signal for driving a ultrasonic transducer and supplying the driving signal to the handpiece selectively connected to the connector;

a sweep circuit for sweeping a frequency of the driving signal;

a data transfer circuit for transferring start frequency data based on the handpiece selectively connected to the connector to the sweep circuit to start sweeping the frequency of the driving signal;

a detection circuit for detecting the resonance frequency of the handpiece selectively connected to the connector, based on the driving signal of which the frequency has been swept by the sweep circuit; and

a phase lock loop (PLL) circuit for locking a frequency of an output current onto the resonance frequency according to a detection result from the detection circuit.

3. An ultrasonic operation system comprising:

a plurality of handpieces including ultrasonic transducers which generate ultrasonic oscillations and exhibit different resonance frequencies respectively, and which are used to treat a living tissue using ultrasonic oscillations;

a connector through which the plurality of handpieces are selectively connected;

a driving signal oscillator for producing a driving signal for driving an ultrasonic transducer and supplying the driving signal to the handpiece selectively connected to the connector;

a sweep circuit for sweeping a frequency of the driving signal;

a data transfer circuit for transferring start frequency data based on the handpiece selectively connected to the connector to the sweep circuit to start sweeping the frequency of the driving signal;

a detection circuit for detecting the resonance frequency of the handpiece selectively connected to the

connector, based on the driving signal of which the frequency has been swept by the sweep circuit; and

a phase lock loop (PLL) circuit for locking the frequency of an output current onto the resonance frequency where the resonance frequency is detected by the detection circuit; and

an adjustment circuit for adjusting the current level of the driving signal of which the frequency has been swept where the resonance frequency is not detected by the detection circuit.